

(19)日本国特許庁(J P)

(12) 公開実用新案公報 (U)

(11)実用新案出願公開番号

実開平5-5106

(43)公開日 平成5年(1993)1月26日

(51)Int.Cl.⁵

A 6 1 B 17/39

1/00

17/39

識別記号

3 1 0

3 3 4

3 2 0

庁内整理番号

7720-4C

7831-4C

7720-4C

F I

技術表示箇所

審査請求 未請求 請求項の数1(全 3 頁)

(21)出願番号

実願平3-51766

(22)出願日

平成3年(1991)7月4日

(71)出願人 000000376

オリンパス光学工業株式会社

東京都渋谷区幡ヶ谷2丁目43番2号

(72)考案者 岡田 勉

東京都渋谷区幡ヶ谷2丁目43番2号 オリ

ンパス光学工業株式会社内

(72)考案者 清水 宏一

東京都渋谷区幡ヶ谷2丁目43番2号 オリ

ンパス光学工業株式会社内

(72)考案者 小賀 喜生

東京都渋谷区幡ヶ谷2丁目43番2号 オリ

ンパス光学工業株式会社内

(74)代理人 弁理士 鈴江 武彦

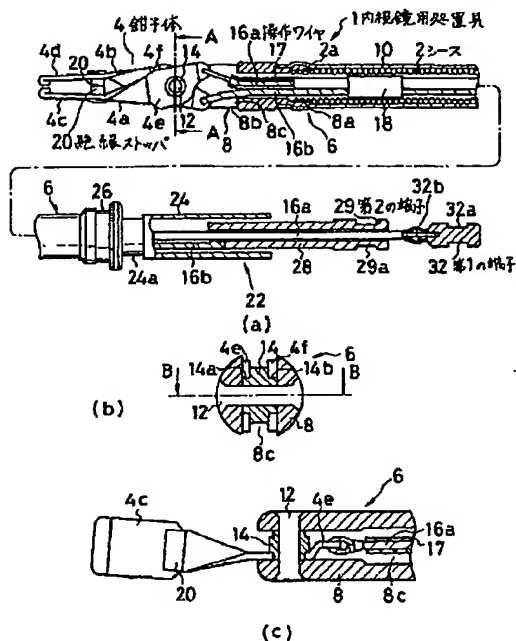
最終頁に続く

(54)【考案の名称】 内視鏡用高周波処置具

(57)【要約】

【目的】接触不良による熱傷等を防止し、効率よく処理を行なうとともに、患部の把持を確実に行なえる内視鏡用高周波処置具の提供を目的としている。

【構成】内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管2と、この可撓管2の先端に、互いに電気絶縁されて開閉自在に枢着された一対の処理用電極4a、4bと、各電極4a、4bにそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管2内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブル16a、16bと、各ケーブル16a、16bの末端を個々に高周波電源に導通させる接続手段を含む操作部30とからなり、前記処理用電極4a、4bに、その内側に突出し、電極4a、4bの開状態時に各電極4a、4bの先端が接触するのを防止する少なくとも1つの絶縁ストッパ20を設けたものである。



1

【実用新案登録請求の範囲】

【請求項1】 内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管と、この可撓管の先端に、互いに電気絶縁されて閉閉自在に枢着された一対の処理用電極と、各電極にそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブルと、各ケーブルの末端を個々に高周波電源に導通させる接続手段を含む操作部とからなり、前記処理用電極は、その内側に突出し、電極の開閉状態時に各電極の先端が接触するのを防止する少なくとも1つの絶縁ストッパを有することを特徴とする内視鏡用高周波処置具。

【図面の簡単な説明】

【図1】 (a) は本考案の第1の実施例を示す内視鏡用高周波処置具の挿入部および接続部における側断面図、(b) は(a)のA-A線に沿う縦断面図、(c) は(b)のB-B線に沿う断面図である。
 【図2】 本考案の第1の実施例を示す内視鏡用高周波処置具の操作部の概略構成図である。

*20

2

*【図3】 図2の操作部に図1の接続部を接続した詳細断面図である。

【図4】 (a) は図3のC-C線に沿う断面図、(b) は図3のD-D線に沿う断面図である。

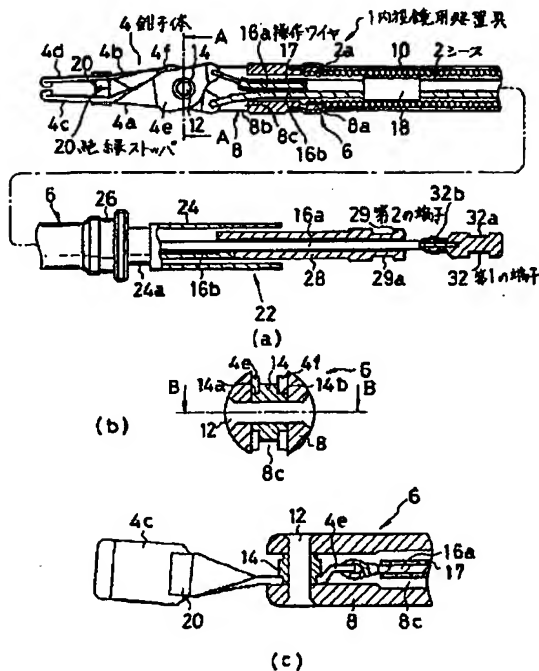
【図5】 図1の内視鏡用高周波処置具の絶縁ストッパの変形例を示す断面図である。

【図6】 図1の内視鏡用高周波処置具の絶縁ストッパの変形例を示す断面図である。

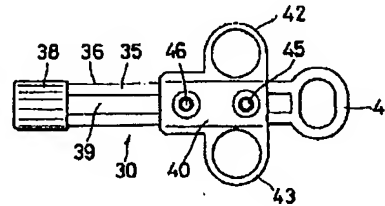
【符号の説明】

- 10…内視鏡用高周波処置具
- 2…シース
- 4…鉗子体
- 12…回転ピン
- 16…操作ワイヤ
- 18…収束部材
- 20, 70, 75…絶縁ストッパ
- 28, 32…第2の端子
- 30…操作部
- 45, 46…取付部

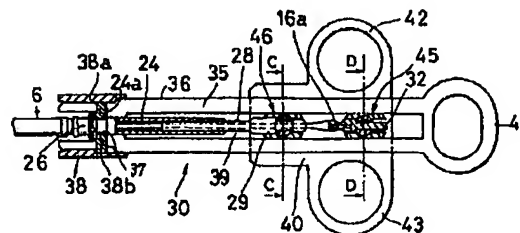
【図1】



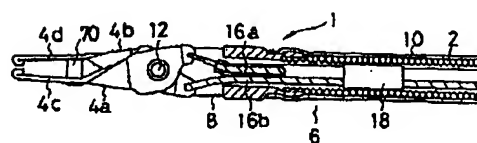
【図2】



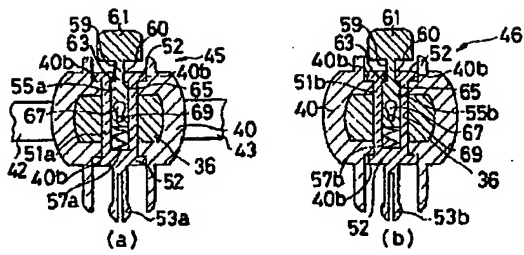
【図3】



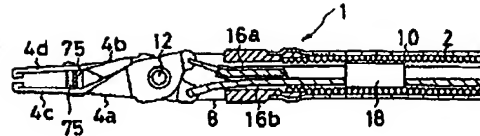
【図5】



【図4】



【図6】



フロントページの続き

(72)考案者 川島 晃一

東京都渋谷区幡ヶ谷2丁目43番2号 オリ
ンパス光学工業株式会社内

(72)考案者 真木 憲一郎

東京都渋谷区幡ヶ谷2丁目43番2号 オリ
ンパス光学工業株式会社内

(72)考案者 林 正明

東京都渋谷区幡ヶ谷2丁目43番2号 オリ
ンパス光学工業株式会社内

(72)考案者 河野 裕宣

東京都渋谷区幡ヶ谷2丁目43番2号 オリ
ンパス光学工業株式会社内

【考案の詳細な説明】

【0001】

【産業上の利用分野】

本考案は、経内視鏡的に体腔内へ導入し、体腔内組織の切開、切除あるいは凝固等の処理を行なう内視鏡用高周波処置具に関する。

【0002】

【従来の技術】

従来、経内視鏡的に使用される高周波処置具としては、特開昭58-152914号公報に示すように、一方の処理側電極のみを体腔内へ導入し、他方の電極（対極板）は患部の体皮に広く接触させ、体腔内に導入された前記処理側電極の患部との接触部に高周波電流を集中させて、その接触部の組織の切開、切除あるいは凝固等の処置を行なうものが知られている。

【0003】

また、実公昭53-34232号公報やUSP第4005714号明細書に示されているように、患部組織と接触しない部位に絶縁材を被覆することによって相互に絶縁され、かつ弾性拡開性を付与された2極の処理用電極をシース先端から突没させることによってこれら2極の処理用電極を開閉させ、これによって患部を把持して前記種々の処置を行なう高周波処置具が提案されている。

【0004】

また、これとは逆にドイツ特許公開公報DE2734847号明細書に示されるものは、シースが、弾性拡開性を付与されて前記シース内に収容された2極の処理用電極に対して移動することによって前記2極の処理用電極をシース先端から突没させて開閉させ、これによって患部を把持して前記各公報のものと同様の処置を行なおうとするものである。

【0005】

【考案が解決しようとする課題】

しかし、特開昭58-152914号公報のものは、一方の処理側電極のみを体腔内へ導入し、他方の電極（対極板）は患部の体皮に接触させて処置を行なうため、効率及び処理能力の点で不都合であったり、また、対極板の接触不良によ

り、体皮に熱傷を生じる虞があった。

【0006】

これに対し、実公昭53-34232号公報やUSP4005714のものは、患部の体皮に配置される対極板がないため、接触不良による体皮の熱傷は回避され得るものの、弾性拡開性を付与された2極の処理用電極がシースから進退移動するため、患部を確実に把持することができない場合があった。また、各電極の絶縁被覆部分が摺動するため、この被覆部位が弛み、作動不良を生じる虞があった。

【0007】

一方、ドイツ特許公開公報DE2734847号明細書に記載されたものは、シースが移動するため電極がしなり易く、そのため患部を確実に把持することができなかった。

【0008】

本考案は上記事情に着目してなされたものであり、その目的とするところは、接触不良による熱傷等を防止し、効率よく処理を行なうとともに、患部の把持を確実に行なえる内視鏡用高周波処置具を提供することにある。

【0009】

【課題を解決するための手段】

上記課題を解決するために、本考案の内視鏡用高周波処置具は、内視鏡の処置具挿通用チャンネルに挿通されるべき電気絶縁性を有する可撓管と、この可撓管の先端に、互いに電気絶縁されて開閉自在に枢着された一対の処理用電極と、各電極にそれぞれ接続されてこれら電極の開閉操作を行なうとともに、前記可撓管内において互いに電気絶縁されて延在し、一部で互いに固定された複数の導電用および作動用のケーブルと、各ケーブルの末端を個々に高周波電源に導通させる接続手段を含む操作部とからなり、前記処理用電極に、その内側に突出し、電極の閉状態時に各電極の先端が接触するのを防止する少なくとも1つの絶縁ストッパを設けたものである。

【0010】

【作用】

各処理用電極に接続された導電性の作動ケーブルの末端を個々に高周波電源に導通させる接続手段によって、前記処理用電極に高周波電流を供給するため、両電極間には高周波電流が局部的に流れる。また、処理用電極は可撓管の先端に、開閉自在に互いに枢着されるとともに、作動ケーブルは一部で互いに固定されているので、処理用電極の開閉操作を行なう際、その操作力は各作動ケーブルに均等に伝わるができることとともに、処理用電極の開閉動作を確実にこなって患部組織を確実に把持することができる。また、把持力の規制は絶縁ストッパによって行なわれる。

【0011】

【実施例】

以下、図面を参照しつつ本考案の実施例を説明する。図1および図2は本考案の第1の実施例を示したものである。図1の(a)は本実施例の内視鏡用高周波処置具1の要部構成を示すもので、2は内視鏡の処置具挿通用チャンネルに挿通され、可撓性を有する金属性のコイルシースであり、後述する鉗子体4とともに内視鏡用高周波処置具1の挿入部6を構成している。このシース2の先端には略管状の絶縁性を有する先端カバー部材8が固定されている。シース2の先端部外周面には、先端カバー部材8の基端部側に形成された固定部8aが嵌着する固定用溝部2aが形成されている。

【0012】

先端カバー部材8の先端部側には、固定部8aよりも大径な大径部8bが形成されている。この先端カバー部材8の大径部8bにはスリット部8cが形成されている。そして、先端カバー部材8の固定部8aからコイルシース2の外周にかけて絶縁性チューブ10が被覆されている。

【0013】

さらに、先端カバー部材8のスリット部8cの開口端側には、処理用電極としての一对の鉗子体4a、4bが回動ピン12を中心に回動自在に連結されて先端が開閉可能になっている。これらの鉗子体4a、4bには先端部側に体腔内の異物等を把持する把持部4c、4d、基端部側に回動ピン12に固定される固定部4e、4fがそれぞれ形成されている。

なお、各鉗子体4 a, 4 bは、例えば金属板等の板材の一部をねじって把持部4 c, 4 dと固定部4 e, 4 fとを形成したものである。

【0014】

さらに、先端カバー部材8のスリット部8 c内には図1の(b)に示すように回転ピン12の周囲に電気絶縁性の間隔部材14が装着されている。さらに、この間隔部材14の両端部には鉗子体連結溝14 a, 14 bが形成されている。そして、この間隔部材14の鉗子体連結溝14 a, 14 bと先端カバー部材8におけるスリット部8 cの内壁面との間で各鉗子体4 a, 4 bの固定部4 e, 4 fが回転自在に枢支されるとともに、各鉗子体4 a, 4 bは相互に絶縁されている。また、鉗子体4 a, 4 bの把持部4 c, 4 dにはそれぞれ、その内側に突出して、把持部4 c, 4 dの閉状態時に相互に接触して把持部4 c, 4 dの先端の接触を防止する絶縁ストッパ20, 20が設けられている。

【0015】

また、シース2内には作動ケーブルとしての2本の操作ワイヤ16 a, 16 bが挿通され、それぞれ鉗子体4 a, 4 bの固定部4 e, 4 fに、図1の(c)に示すように輪を形成して接続されている。なお、操作ワイヤの一方16 aは、絶縁性のチューブ17で被覆され、先端部側で他方16 bと集束部材18によって結束されている。

【0016】

挿入部6は、その手元側に接続される接続部22によって図2に示す操作部30に接続される。この場合、挿入部6のシース2の基端部が接続部22の接続部材24先端に設けられたシース接続部26に接続される。

【0017】

接続部材24のシース接続部26の後方外周部には第3のくびれ溝24 aが形成されている。また、絶縁チューブ17が被覆されていない操作ワイヤ16 bが管状部材28に機械的かつ電氣的に接続している。この管状部材28は、その先端側の一部が接続部材24内に略同軸に配設されており、基端側は接続部材24の基端より突出している。また、絶縁チューブ17が被覆された操作ワイヤ16 aは、管状部材28内を通して延び、管状部材28の基端より突出して、第1の

端子32の先端側に形成された固定部32bに機械的かつ電氣的に結合している。第1の端子32の基端側外周には第1のくびれ溝32aが形成されている。また、管状部材28の基端側は第2の端子29となっており、この第2の端子29の外周にも第2のくびれ溝29aが形成されている。

【0018】

操作部30は、レール35を有する本体36と、この本体36の先端に設けられたシース固定部38と、本体36の軸方向に沿って摺動自在に設けられたスライダ40とからなる。

【0019】

シース固定部38には接続部材24のシース接続部26が着脱自在に接続できるようになっている。すなわち、図3に示すように、シース固定部38は回転環38aと固定板38bとからなり、回転環38a内には偏心した穴が設けられている。そして、この穴内に固定板38bが組み込まれていて、回転環38aを一定の方向に回転させることによって必然的に前記偏心穴も回転し、これによって偏心穴内に組み込まれた固定板38bが上方向にスライドして、固定板38bに設けられた小孔37内に接続部材24の第3のくびれ溝24aに係合するようになっているものである。また、この係合を解除するには回転環38aを前記方向と逆方向に回転させればよい。

【0020】

操作部30の本体36は、中央にスリット39を有し、末端に親指かけ部41を有する。また、スライダ40は2つの指かけ42、43を有するとともに、軸方向に間隔をおいて2つの取付部、すなわち、第1の取付部45と第2の取付部46を有する。第1および第2の取付部45、46は各操作ワイヤ16a、16bの末端を個々に高周波電源に導通させる接続手段を構成している。

【0021】

第1および第2の取付部45、46はそれぞれ、図4の(a)、(b)に示すように、スライダ40に固定されスリット39内を摺動可能な略筒状の第1の収容部材51aと第2の収容部材51bを有している。

【0022】

第1の収容部材51aと第2の収容部材51bは両端部に形成されたフランジ部52をスライダ40の外周面に形成された溝部40bに係止することによってスライダ40に固定されるとともにスリット39内に保持される。

【0023】

第1および第2の収容部材51a, 51bの一方の端部には、高周波電源との電氣的接続をなす第1および第2のプラグ53a, 53bがフランジ部52より延出して形成されている。第1および第2の収容部材51a, 51b内には、第1および第2の押し棒55a, 55bと、これら押し棒55a, 55bを収容部材51a, 51bの軸方向に付勢する第1および第2のばね57a, 57bが収容されている。第1および第2の押し棒55a, 55bは、ばね57a, 57bによって付勢される側と反対側の端部が細く形成されたくびれ部59となっており、このくびれ部59は、第1および第2の収容部51a, 51bの他方の端部に設けられた開口部60から外部に突出しており、この突出した端部は大径なボタン部61に形成されている。そして、押し棒55a, 55bは、通常の状態においては、ばね57a, 57bの付勢力によって、くびれ部59を形成する段差部63が収容部材51a, 51bの内周面端部に形成された段差部65に突当たった状態で収容部材51a, 51b内に保持されている。

また、第1および第2の押し棒55a, 55bにはそれぞれ、通孔67と、この通孔67に達する溝69がそれぞれ形成されている。

【0024】

挿入部6を操作部30に接続する際には、まず、接続部22の基端側部分を操作部30の本体36のスリット39内に通す。そして、第1および第2の取付部45, 46のボタン部61を押し込むことによって第1および第2の押し棒55a, 55bを第1および第2のばね57a, 57bの付勢力に抗して押し込み、第1および第2の押し棒55a, 55bの通孔67内に接続部22の第1の端子32と第2の端子29を挿入する。そして、第1の端子32の第1のくびれ溝32aと第2の端子29の第2のくびれ溝29aを第1および第2の押し棒55a, 55bの溝69付近に位置させた後、ボタン部61を離す。これによって、第1および第2の押し棒55a, 55bが第1および第2のばね57a, 57bの

付勢力によって押し上げられ、第1および第2の押し棒55a, 55bの溝69に第1の端子32の第1のくびれ溝32aと第2の端子29の第2のくびれ溝29aが嵌合し、操作ワイヤ16a, 16bがスライダ40に固定される。

【0025】

さらに、操作部30のシース固定部38内に接続部材24のシース接続部26付近を位置させるとともに、シース固定部38の回転環38aを回転させて固定板38bをスライドさせ、固定板38bを接続部材24の第3のくびれ溝24aに係合させる。これによって、シース2が接続部22に接続されるとともに、操作部30と連結されるものである。

【0026】

次に、上記構成の内視鏡用高周波処置具1の動作について説明する。まず、内視鏡用高周波処置具1の使用時には内視鏡の挿通チャンネルを介してこの内視鏡用高周波処置具1が体腔内に導入される。そして、内視鏡による観察下で内視鏡用高周波処置具1の先端部を回収しようとする異物に近づけた後、内視鏡用高周波処置具1を操作する。

【0027】

この内視鏡用高周波処置具1の操作時には操作部のスライダ40を操作する。この場合、例えば操作部30のスライダ40を先端部側に向けて押し出し操作することにより、操作ワイヤ16a, 16bを一緒に押し進めて先端の鉗子体4a, 4bの把持部4c, 4dを開き、この開いた鉗子体4a, 4bを体腔内組織、例えば出血部位に誘導する。

【0028】

この状態で、続いて操作部30のスライダ40を手元側に引き操作して操作ワイヤ16a, 16bを手元側に引っ張り操作することにより、先端の鉗子体4a, 4bの把持部4c, 4dを閉じ、異物を把持する。この時、各把持部4c, 4dに設けられた対向するストッパ20, 20同志の当接によって把持部4c, 4dの先端は接触しない。

【0029】

そして、図示しない高周波電源と、操作部30のスライダ40内の第1の取付

部4.5および第2の取付部4.6に設けられた収容部材5.1a, 5.1bのプラグ5.3a, 5.3bとを電氣的に接続して、第1の取付部4.5および第2の取付部4.6を介して各操作ワイヤ1.6a, 1.6bに個々に高周波電流を流して鉗子体4.a, 4.bに通電すると、両把持部4.c, 4.d間に高周波電流が流れるので、把持した組織が焼灼凝固できる。

【0030】

したがって、上記構成の内視鏡用高周波処置具1は、操作部30のスライダ40に設けられた2つの取付部4.5, 4.6を介して各操作ワイヤ1.6a, 1.6bの末端を個々に高周波電源に導通させる接続手段を構成するとともに、これによって、処理用電極としての鉗子体4.a, 4.bに個々に高周波電流を供給するものであるため、局所的な処理能力を高めることができる。

また、体極板を使用していないため、接触不良等によって体皮を熱傷させることがない。

【0031】

さらに、鉗子体4.a, 4.bは先端カバー8に枢着され、回動ピン12を軸心として施回して開閉するとともに、操作ワイヤ1.6a, 1.6bは互いに集束部材18によって結束され、1つのスライダ40に確実に固定されているので、鉗子体4.a, 4.bの開閉動作を行なう際、操作ワイヤ1.6a, 1.6bに均等に力を伝えることができ、把持部4.c, 4.dの開閉動作を確実に行なって患部組織を確実に把持することができる。

【0032】

また、その一方で、鉗子体4.a, 4.bの把持部4.c, 4.dには、その内側に突出する絶縁ストッパ20, 20が設けられ、把持部4.c, 4.dの閉状態時に相互に接触して把持部4.c, 4.dの先端が接触することを防止しているため、患部組織を把持しすぎて、これを機械的に切断してしまうことがない。

なお、各操作ワイヤ1.6a, 1.6bの末端を個々に高周波電源に導通させる接続手段は、上記構成のものに限られるものではない。

【0033】

また、鉗子体4.a, 4.bの把持部4.c, 4.dの閉状態時に把持部4.c, 4.dの

先端が接触することを防止する絶縁ストッパは、図5に示すように、把持部の一方4aにのみ設けられて、把持部4c、4dの閉状態時に、把持部の他方4bの内面と接触するようなもの70であってもよい。あるいは、図6に示すように、各把持部4c、4dの内面に設けられて、互いに当接することなく、相對する把持部4c、4dの内面にそれぞれ接触するようなもの75、75であってもよい。

【0034】

【考案の効果】

以上説明したように、本考案は、各処理用電極に接続された導電性の作動ケーブルの末端を個々に高周波電源に導通させる接続手段によって、前記処理用電極に高周波電流を供給し、阿電極間に高周波電流を局部的に流すため、その処理能力を高めることができる。

また、体極板を使用していないため、その接触不良等によって体皮を熱傷させることがない。

【0035】

さらに、処理用電極は可撓管の先端に、開閉自在に互いに枢着されるとともに、各作動ケーブルは一部でまとめて固定されているので、処理用電極の開閉操作を行なう際、各作動ケーブルに均等に操作力を伝えることができ、処理用電極の開閉動作を確実にこなって患部組織を確実に把持することができる。また、その一方で、処理用電極は、その内側に突出し、電極の開状態時に各電極の先端が接触するのを防止する絶縁ストッパを有しているため、患部組織を把持しすぎて、これを機械的に切断してしまうことがない。

**A translation of the full text of Japanese Utility Model Unexamined
Publication No.5-5106**

Japanese Utility Model Laid-Open No. 05-5106

Publication Date: January 26, 1993

Application No. 03-51766

Application Date: July 4, 1991

Inventor: T. Okada, et al.

Applicant: OLYMPUS OPTICAL CO., LTD.

[Name of Document] SPECIFICATION

[Title of the Device] HIGH FREQUENCY TREATMENT TOOL FOR
ENDOSCOPE

[Claims]

[Claim 1]

A high frequency treatment tool for an endoscope, comprising:

a flexible tube with an electrical insulation, which should be inserted into
a channel for insertion of a treatment tool of an endoscope;

a pair of electrodes for treatment, which are electrically insulated each
other, and which are pivotably attached to a jaw of said flexible tube so as to
open and close;

a plurality of cables for conduction and operation, connected to each of
the electrodes for performing an open and close operations of these electrodes,
and extended within the flexible tube as being electrically insulated each other,

and being partly fixed each other, and

an operation unit including a connecting means for connecting an end of each of cables individually with a high frequency power source,

wherein said electrodes for treatment are provided with at least one insulated stopper, which is protruded an inside of said electrodes, and which is to prevent a jaw of the respective electrodes from contacting in a closed state of the electrodes.

[Detailed Description of the Device]

[0001]

[Industrial Field of the Device]

The present device relates to a high frequency treatment tool for an endoscope, which is adapted for endoscopically introducing it into an abdominal cavity, and for performing treatments such as a cut or a coagulation and the likes of a tissue in the abdominal cavity.

[0002]

[Description of the Related Art]

Conventionally, as disclosed in Japanese Patent Laid-Open No. 58-152914, it is known a high frequency treatment tool to be used endoscopically, in which only one of the electrodes on the treatment side is introduced into the abdominal cavity, while the other of the electrodes (a patient plate) widely contacts with a body skin of a diseased site, and then a high frequency current is concentrated onto a contact portion at where the electrode on the treatment side introduced into the abdominal cavity contacts with the diseased site, so as to perform the treatments such as a cut or a coagulation and

the likes of the tissue at such contact portion.

[0003]

Further, as disclosed in Japanese Utility Model Examined Laid-Open No. 53-34232 and U. S. Patent No. 4,005,714, it has been proposed the high frequency treatment tools adapted for performing a variety of treatments by opening and/or closing a two-poles electrode for treatment, which is insulated each other by coating a member that does not contact a diseased tissue with an insulation material, and which is provided with an elastic spreadability, and immersing the two-poles-electrode from a jaw of a sheath, and then gripping the diseased site.

[0004]

On the other hand, the one disclosed in the Germany Patent Laid-Open DE2734847, is adapted for performing the same treatments as the ones in the aforementioned publications by moving a sheath relative to a two-poles electrode for treatment, which is contained in the sheath with an elastic spreadability provided, immersing and opening and/or closing the same, and then gripping the diseased site.

[0005]

[Problems to be Solved by the Device]

However, because the one disclosed in Japanese Patent Laid-Open No. 58-152914 performs the treatments by introducing only one of the electrodes on a treatment side into a abdominal cavity, and contacting the other of the electrodes (the patient plate) with the body skin in the diseased site, there are some inconveniences in terms of an efficiency and a treatment capability, and

also it is likely to generate a thermal burn in the body skin by a contact failure of the patient plate.

[0006]

On the other hand, although the thermal burn in the body skin caused by the contact failure may be avoided for the ones disclosed in Japanese Utility Model Examined Laid-Open No. 53-34232 and U. S. Patent No. 4,005,714 since they have no patient plate to be placed on the body skin of the diseased site, there is an occasion in which the diseased site cannot be gripped firmly since the two-poles electrode for treatment with the elastic spreadability provided moves back and forth from the sheath. Further, because the insulation coated part in each electrode slidably moves, the insulation coated part may be slacked, and thus it is likely to generate an operation failure.

[0007]

The one disclosed in the Germany Patent Laid-Open DE2734847 is such that the electrodes thereof can be easily bowed because the sheath is moved, and as a consequence, the diseased site cannot be gripped firmly.

[0008]

The present device is invented in view of the aforementioned problems, and an object thereof is to provide a high frequency treatment tool for an endoscope, which is capable of preventing a thermal burn by a contact failure, and performing a treatment efficiently, as well as gripping a diseased site firmly.

[0009]

[Means for Solving the Problems]

In order to solve the aforementioned problems, a high frequency

treatment tool for an endoscope of the present device comprises: a flexible tube with an electrical insulation, which should be inserted into a channel for insertion of an treatment tool of an endoscope; a pair of electrodes for treatment, which are electrically insulated each other, and which are pivotably attached to a jaw of said flexible tube in a freely opening and closing fashion; a plurality of cables for conduction and operation, connected to each of the electrodes for performing an open and close operations of these electrodes, and extended within the flexible tube as being electrically insulated each other, and being partly fixed each other; and an operation unit including a connecting means for connecting an end of each of cables individually with a high frequency power source, wherein said electrodes for treatment are provided with at least one insulated stopper, which is protruded an inside of said electrodes, and which is to prevent a jaw of the respective electrodes from contacting in a closed state of the electrodes.

[0010]

[Operation]

A high frequency current flows locally between both electrodes because the high frequency currents are provided to the electrodes for treatment by the connecting means for connecting the ends of the conductive operation cables, which are connected to the respective electrodes for treatment, with the high frequency power source individually. Further, because the electrodes for treatment are pivotably attached to a jaw of said flexible tube in a freely opening and closing fashion each other, as well as the operation cables are partly fixed each other, when the opening/closing operations of the electrodes for treatment are to be performed, the operational forces thereof can be equally delivered to

the respective operation cables, transmitted, as well as the tissues of diseased site can be gripped firmly by performing the opening/closing operations of the electrodes for treatment assuredly. In addition, a control of a gripping force is performed by the insulated stopper.

[0011]

[Description of the Embodiment(s)]

In the followings, the embodiments of the present device will be described with reference to the drawings. Figures 1 and 2 show the first embodiment of the present device. In Figure 1 (a) there is shown the main components of a high frequency treatment tool (1) for an endoscope. In Figure 1 (a), a reference numeral (2) represents a flexible metallic coil sheath to be inserted into a channel for inserting-into a treatment tool of the endoscope. The metallic coil sheath (2) forms an insertion part (6) of the tool (1), together with forceps (4), which will be described later. A tube-like jaw cover member (8) having an insulation property is fixed at a jaw of the sheath (2). A groove part (2a) for fitting is formed on a peripheral surface of the jaw of the sheath (2). A fitting part (8a) formed on a base end of the jaw cover member (8) is fitted with the groove part (2a).

[0012]

On a jaw side of the jaw cover member (8), a large diameter part (8b) having a diameter larger than that of the fitting part (8a) is formed. A slit (8c) is formed in the large diameter part (8b) of the jaw cover member (8). An insulation tube (10) is coated from the fitting part (8a) of the jaw cover member (8) through a periphery of the coil sheath (2).

[0013]

Further, at an opening end of the slit part (8c) of the jaw cover member (8), a pair of the forceps (4a, 4b) as electrodes for treatment are pivotally connected around a pivot pin (12) so that the jaw is enabling to open and close. In these forceps (4a, 4b), the grip parts (4c, 4d) for gripping foreign substances and the like within a body cavity are formed on the jaw thereof, and the fitting parts (4e, 4f) to be fitted to the pivot pin (12) are formed on the base end thereof, respectively.

In the meantime, each of the forceps (4a, 4b) is arranged such that the gripping parts (4c, 4d) and the fitting parts (4e, 4f) are formed by twisting portions of a plate material, for example a metallic plate.

[0014]

Further, within the slit part (8c) in the jaw cover member (8), as shown in Figure 1 (b), an electrical insulation spacing member (14) is attached around the pivot pin (12). In addition, forceps connecting grooves (14a, 14b) are formed at both ends of the spacing member (14). The fitting parts (4e, 4f) of the respective forceps (4a, 4b) are pivotally supported between the forceps connecting grooves (14a, 14b) of the spacing member (14) and an inner wall of the slit part (8c) in the jaw cover member (8), while the respective forceps (4a, 4b) are insulated from each other. In the gripping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the gripping parts (4c, 4d) so as to prevent the jaws of the gripping parts (4c, 4d) from contacting each other.

[0015]

In the sheath (2), the two operation wires (16a and 16b) are inserted in as the operation cables, and are connected to the fitting parts (4e, 4f) in the respective forceps (4a, 4b), respectively, with forming the rings as shown in Figure 1 (c). One (16a) of the operation wires is coated with an insulating tube (17), and being tied with the other (16b) of the operation wires at the jaw side by the bundling member (18).

[0016]

An insertion unit (6) is connected to an operation unit (30) shown in Figure 2 by a connecting unit (22), which is to be connected to a hand side thereof. In this case, a base end of the sheath (2) in the insertion unit (6) is connected to a sheath connecting unit (26) provided at the jaw of the connecting member (24) of the connecting unit (22).

[0017]

A third constricted slot (24a) is formed in a back peripheral unit of the sheath connecting unit (26) of the connecting member (24). Also, the operation wire (16b) not coated with an insulating tube (17) is connected with a tubular member (28) electrically and mechanically. For this tubular member (28), a portion at a jaw side thereof is installed approximate coaxially within the connecting member (24), and the base end side thereof is protruded from a base end of the connecting member (24). The operation wire (16a) coated with the insulating tube (17) extends through the tubular member (28), protrudes from the base end of the tubular member (28), and couples with the fitting unit (32b) formed at the jaw side of the first terminal (32) electrically and mechanically. A

first constricted slot (32a) is formed in a periphery at the base end side of the first terminal (32). Also, the base end side of the tubular member (28) becomes as a second terminal (29), and a second constricted slot (29a) is formed in a periphery of this second terminal (29).

[0018]

The operation unit (30) includes a main body (36), a sheath fitting unit (38) provided at a jaw of the main body (36), and a slider (40) slidably provided along an axial direction of the main body (36).

[0019]

It is configured that the sheath connecting unit (26) of the connecting member (24) enables to detachably connect to the sheath fitting unit (38). That is to say, as shown in Figure 3, the sheath fitting unit (38) includes a rotating ring (38a) and a fitting plate (38b), and an eccentric hole is formed in the rotating ring (38a). Then, the fitting plate (38b) is embedded in this hole, and by rotating the rotating ring (38a) in a fixed direction, the eccentric hole also rotates inevitably, thereby the fitting plate (38b) embedded in the eccentric hole slides in an upward direction, and it is configured that the third constricted slot (24a) of the connecting member (24) is engaged with a stoma (37) provided in the fitting plate (38b). Also, in order to disengage them, it is only necessary to rotate the rotating ring (38a) in a direction opposite to the aforementioned direction.

[0020]

The main body (36) in the operation unit (30) includes a slit at a center, and a parent finger hook unit (41) at an end. The slider (40) includes two finger hooks (42, 43), as well as two attaching units, i.e., a first attaching unit (45) and a

second attaching unit (46), which are spaced apart each other in an axial direction. The first and second fitting units (45, 46) constitute connecting means for connecting the ends of the respective operation wires (16a, 16b) to the high frequency power source, individually.

[0021]

The first and second fitting units (45, 46) includes an approximately cylindrical first container member (51a) and an approximately cylindrical second container member (51b), each of which is fixed to the slider (40) and can slide in the slit (39), respectively.

[0022]

By engaging the flange units (52) formed at both end units with the slot (40b) formed in a peripheral surface of the slider (40), the first container member (51a) and second container member (51b) are fixed to the slider (40) as well as held in the slit (39), respectively.

[0023]

A first plug (53a) and second plug (53b), each of which makes an electrical connection with the high frequency power source are extended from the flange unit (52) and formed at one ends of the first container member (51a) and of the second container member (51b), respectively. A first push rod (55a) and second push rod (55b), as well as a first spring (57a) and second spring (57b) for energizing these push rods (55a, 55b) in axial directions of the containing member (51a, 51b) are accommodated in the first container member (51a) and second container member (51b), respectively. In the first and second push rods (55a, 55b), ends thereof at the opposite side of the one which is

energized by the springs (57a, 57b) are a constricted unit (59) formed in a slender, and this constricted unit (59) protrudes outside from an opening unit (60) provided at the other ends of the first container member (51a) and second container member (51b), and this protruded end is formed in a button unit (61) with a large diameter. In a usual state, the push rods (55a, 55b) are held in the container members (51a, 51b) by the energizing forces of the springs (57a, 57b) in a state that a level difference (step) unit (63), which forms the constricted unit (59), runs against a level difference unit (65) formed at an end of an inner peripheral surface.

Further, a through-hole (67) and a slot (69), which reaches to the through-hole (67), are formed in the first and second push rods (55a, 55b), respectively.

[0024]

When connecting the insertion unit (6) to the operation unit (30), at first, the base end side of the connecting unit (22) is passed through the slit (39) in the main body (36) of the operating unit (30). Then, the first and second pushing rods (55a, 55b) are pushed against the energizing forces of the first and second springs (57a, 57b) by pushing the button unit (61) of the first and second attaching unit (45, 46), thereby inserting a first terminal (32) and a second terminal (29) of the connecting unit (22) into the through-hole (67) of the first and second pushing rods (55a, 55b). Then, after placing the first constricted slot (32a) of the first terminal (32) and the second constricted slot (29a) of the second terminal (29) nearby the slot (69) of the first and second pushing rods (55a, 55b), respectively, the button unit (61) is detached. As a result of this, the

first and second pushing rods (55a, 55b) are pushed up by the energizing forces of the first and second springs (57a, 57b), the first constricted slot (32a) of the first terminal (32) and the second constricted slot (29a) of the second terminal (29) are fitted with the slots (69) of the first and second pushing rods (55a, 55b), and the operation wires (16a, 16b) are fixed to the slider (40).

[0025]

Further, while placing a vicinity of the sheath connecting unit (26) in the connecting member (24) in the sheath fitting unit (38) of the operation unit (30), the fitting plate (38b) slides by rotating the rotating ring (38a) of the sheath fitting unit (38), thereby engaging the fitting plate (38b) with the third constricted slot (24) of the connecting member (24). As a result, the sheath (2) is connected to the connecting unit (22) and also coupled to the operation unit (30).

[0026]

In the followings, an operation of the tool (1) will be described. At first, the tool (1) is introduced into the body cavity via the insert-into channel of the endoscope at a time of using the tool (1). After having moved the jaw of the tool (1) closer to the foreign substances under an observation with the endoscope, the tool (1) is then operated.

[0027]

A slider (40) in the operation part (30) is operated at a time of operating the tool (1). In this case, the slider (40) of the operating part (30) is pushed toward the jaw side, the operation wires (16a, 16b) are pushed forward along therewith, and the gripping parts (4c, 4d) are opened up at the jaw of the forceps (4a, 4b), and then the opened forceps (4a, 4b) are lead to a tissue in the body

cavity, for example, a bleeding site.

[0028]

In this state, subsequently the operation wires (16a, 16b) are dragged toward the hand side by pulling the slider (40) in the operating part (30) toward the hand side, thereby closing the gripping parts (4c, 4d) at the jaw of the forceps (4a, 4b), and the foreign substances are gripped. At this moment, the jaws of the gripping parts (4c, 4d) do not contact each other by an abutment of the opposite stoppers (20, 20), which are provided in the respective gripping parts (4c, 4d).

[0029]

Further, electrically connecting the high frequency power source which is not illustrated, and the plugs (53a, 53b) in the accommodation member (51a, 51b) provided in the first attaching unit (45) and the second attaching unit (46) of the slider (4) in the operation unit (30), and then energizing the forceps (4a, 4b) individually by flowing a high frequency current through the respective operation wires (16a, 16b) via the first attaching unit (45) and the second attaching unit (46), the high frequency current flows between the gripping parts (4c, 4d), thereby enabling to cautery-coagulate the gripped tissue.

[0030]

Therefore, the high frequency treatment tool (1) for endoscope with the aforementioned constitute, constitutes the connecting means for connecting the ends of the respective operation wires (16a, 16b) via two attaching units (45, 46) provided in the slider (40) of the operation unit (30), as well as individually supplies the high frequency currents to the forceps (4a, 4b) as the electrodes for treatment, with the connecting means, thereby enabling to enhance the local

treatment ability.

In addition, no thermal burn is generated in the body skin by a contact failure and the like, since no patient plate is used.

[0031]

Further, because the forceps (4a, 4b) are pivotably attached to the jaw cover (8), and are pivoted around the pivot pin (12) as an axial center, so as to be opened and/or closed, while the operation wires (16a, 16b) are band together by the bundling member (18), and fixed to one slider (40) firmly, it enables to deliver the force equally to the operation wires (16a, 16b), when performing the open/close operations of the forceps (4a, 4b), and thus the diseased site tissue can be gripped firmly by performing the open/close operations of the gripping units (4c, 4d) reliably.

[0032]

In the gripping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the gripping parts (4c, 4d) so as to prevent the jaws of the gripping parts (4c, 4d) from contacting each other, and thus not over-gripping a diseased tissue, thereby preventing the diseased tissue from being cut mechanically.

Further, the connecting mean for individually connecting the ends of the respective operation wires (16a, 16b) to the high frequency power source is not limited to the aforementioned constituent.

[0033]

An insulation stopper (70) for preventing the jaws of the gripping parts (4c,

4d) from contacting each other at a time of closing the gripping parts (4c, 4d) of the forceps (4a, 4b), may be provided only on one (4a) of the gripping parts, as shown in Figure 5, and is configured to contact with an inner surface of the other one (4b) of the gripping parts in a closing state of the gripping parts (4c, 4d). Alternatively, as shown in Figure 6, the insulation stoppers (75, 75) may be provided on the inner surfaces of the respective gripping parts (4c, 4d), respectively, and is configured to contact with the opposite inner surfaces of the gripping parts (4c, 4d) without abutting each other.

[0034]

[Advantage(s) of the Device]

As described above, since the present device supplies a high frequency current to the electrode for treatment and flows the high frequency current locally between two electrodes by the connecting means for connecting the ends of the conductive operation cables connected to each of the electrodes for treatment individually to a high frequency power supply, it can enhance the treatment ability thereof.

Further, no thermal burn is generated in the body skin by a contact failure and the like, since no patient plate is used.

[0035]

In addition, because the electrodes for treatment are pivotably attached to the jaw of flexible tube each other in a free opening/closing manner, while the respective operation wires are collected partly and fixed, it enables to deliver the force equally to the respective operation wires, when performing the open/close operations of the electrodes for treatment, and thus the diseased site tissue can

be gripped firmly by performing the open/close operations of the electrodes for treatment.

On the other hand, because the electrodes for treatment include the insulating stoppers which are protruded to an inside of the electrodes and prevent the jaws of the respective electrodes from contacting in the closed state of the electrodes, it does not cut the diseased site tissue mechanically by gripping it too strongly.

[Brief Description of the Drawings]

[Figure 1] (a) is a side cross sectional view at the insertion unit and connection unit in the high frequency treatment tool for endoscope, showing a first embodiment of the present device; (b) is a longitude cross sectional view along the line A-A in (a), and (c) is a cross sectional view along the line B-B in (b);

[Figure 2] A schematic configuration view of the operation unit in the high frequency treatment tool for endoscope showing a first embodiment of the present device;

[Figure 3] A detailed cross sectional view in which the connection unit shown in Figure 1 is connected to the operation unit shown in Figure 2;

[Figure 4] (a) is a cross sectional view along the line C-C in Figure 3, and (b) is a cross sectional view along the line D-D in Figure 3;

[Figure 5] A cross sectional view showing an alternative of the insulating stopper of the high frequency treatment tool for endoscope shown in Figure 1; and

[Figure 6] A cross sectional view showing an alternative of the insulating stopper of the high frequency treatment tool for endoscope shown in Figure 1.

[Reference Numerals]

1...HIGH FREQUENCY TREATMENT TOOL FOR ENDOSCOPE

2...SHEATH

4...FORCEPTS

12...PIVOT PIN

16...OPERATION WIRE

18...BUNDLING MEMBER

20, 70, 75...INSULATING STOPPERS

29, 32...SECOND TERMINALS

30...OPERATION UNIT

45, 46...ATTACHING UNITS

A partial translation of Japanese Utility Model Unexamined Publication

No.5-5106

[0011]

[Embodiments]

In the followings, the embodiments of the present device will be described with reference to the drawings. Figures 1 and 2 show the first embodiment of the present device. In Figure 1 (a) there is shown the main components of a radio frequency treatment instrument (1) for use in an endoscope. In Figure 1 (a), a reference numeral (2) represents a flexible metallic coil sheath to be inserted into a channel for use in inserting-into a treatment instrument of the endoscope. The metallic coil sheath (2) forms an insertion part (6) of the instrument (1), together with forceps (4), which will be described later. A tube-like tip cover member (8) having an insulation property is fixed at a tip of the sheath (2). A groove part (2a) for use in fitting is formed on a peripheral surface of the tip part of the sheath (2). A fitting part (8a) formed on a base end of the tip cover member (8) is fitted with the groove part (2a).

[0012]

On a tip part side of the tip cover member (8), a large diameter part (8b) having a diameter larger than that of the fitting part (8a) is formed. A slit (8c) is formed in the large diameter part (8b) of the tip cover member (8). An insulation tube (10) is coated from the fitting part (8a) of the tip cover member (8) through a periphery of the coil sheath (2).

[0013]

Further, at an opening end of the slit part (8c) of the tip cover member (8), a pair of the forceps (4a, 4b) as electrodes for use in treatment are pivotally connected around a pivot pin (12) so that the tip is enabling to open and close. In these forceps (4a, 4b), the grasp parts (4c, 4d) for grasping foreign substances and the like within a body cavity are formed on the tip part thereof, and the fitting parts (4e, 4f) to be fitted to the pivot pin (12) are formed on the base end thereof, respectively.

In the meantime, each of the forceps (4a, 4b) is arranged such that the grasping parts (4c, 4d) and the fitting parts (4e, 4f) are formed by twisting portions of a plate material, for example a metallic plate.

[0014]

Further, within the slit part (8c) in the tip cover member (8), as shown in Figure 1 (b), an electrical insulation spacing member (14) is attached around the pivot pin (12). In addition, forceps connecting grooves (14a, 14b) are formed at both ends of the spacing member (14). The fitting parts (4e, 4f) of the respective forceps (4a, 4b) are pivotally supported between the forceps connecting grooves (14a, 14b) of the spacing member (14) and an inner wall of the slit part (8c) in the tip cover member (8), while the respective forceps (4a, 4b) are insulated from each other. In the grasping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the grasping parts (4c, 4d) so as to prevent the tips of the grasping parts (4c, 4d) from contacting each other.

(Not Translated)

[0026]

In the followings, an operation of the instrument (1) will be described. At first, the instrument (1) is introduced into the body cavity via the insert-into channel of the endoscope at a time of using the instrument (1). After having moved the tip part of the instrument (1) closer to the foreign substances under an observation with the endoscope, the instrument (1) is then operated.

[0027]

A slider (40) in the operation part (30) is operated at a time of operating the instrument (1). In this case, the slider (40) of the operating part (30) is pushed toward the tip part side, the operation wires (16a, 16b) are pushed forward along therewith, and the grasping parts (4c, 4d) are opened up at the tip of the forceps (4a, 4b), and then the opened forceps (4a, 4b) are lead to a tissue in the body cavity, for example, a bleeding site.

[0028]

In this state, subsequently the operation wires (16a, 16b) are dragged toward the hand side by pulling the slider (40) in the operating part (30) toward the hand side, thereby closing the grasping parts (4c, 4d) at the tip of the forceps (4a, 4b), and the foreign substances are grasped. At this moment, the tips of the grasping parts (4c, 4d) do not contact each other by an abutment of the opposite stoppers (20, 20), which are provided in the respective grasping parts (4c, 4d).

(Not Translated)

[0032]

In the grasping parts (4c, 4d) of the forceps (4a, 4b), there are provided the insulation stoppers (20, 20), which are protruded into insides thereof, and thus they contact mutually in a closed state of the grasping parts (4c, 4d) so as to prevent the tips of the grasping parts (4c, 4d) from contacting each other, and thus not over-grasping a diseased tissue, thereby preventing the diseased tissue from being cut mechanically.

(Not Translated)

[0033]

An insulation stopper (70) for preventing the tips of the grasping parts (4c, 4d) from contacting each other at a time of closing the grasping parts (4c, 4d) of the forceps (4a, 4b), may be provided only on one (4c) of the grasping parts, as shown in Figure 5, and is configured to contact with an inner surface of the other one (4d) of the grasping parts in a closing state of the grasping parts (4c, 4d). Alternatively, as shown in Figure 6, the insulation stoppers (75, 75) may be provided on the inner surfaces of the respective grasping parts (4c, 4d), respectively, and is configured to contact with the opposite inner surfaces of the grasping parts (4c, 4d) without abutting each other.

FIG. 1

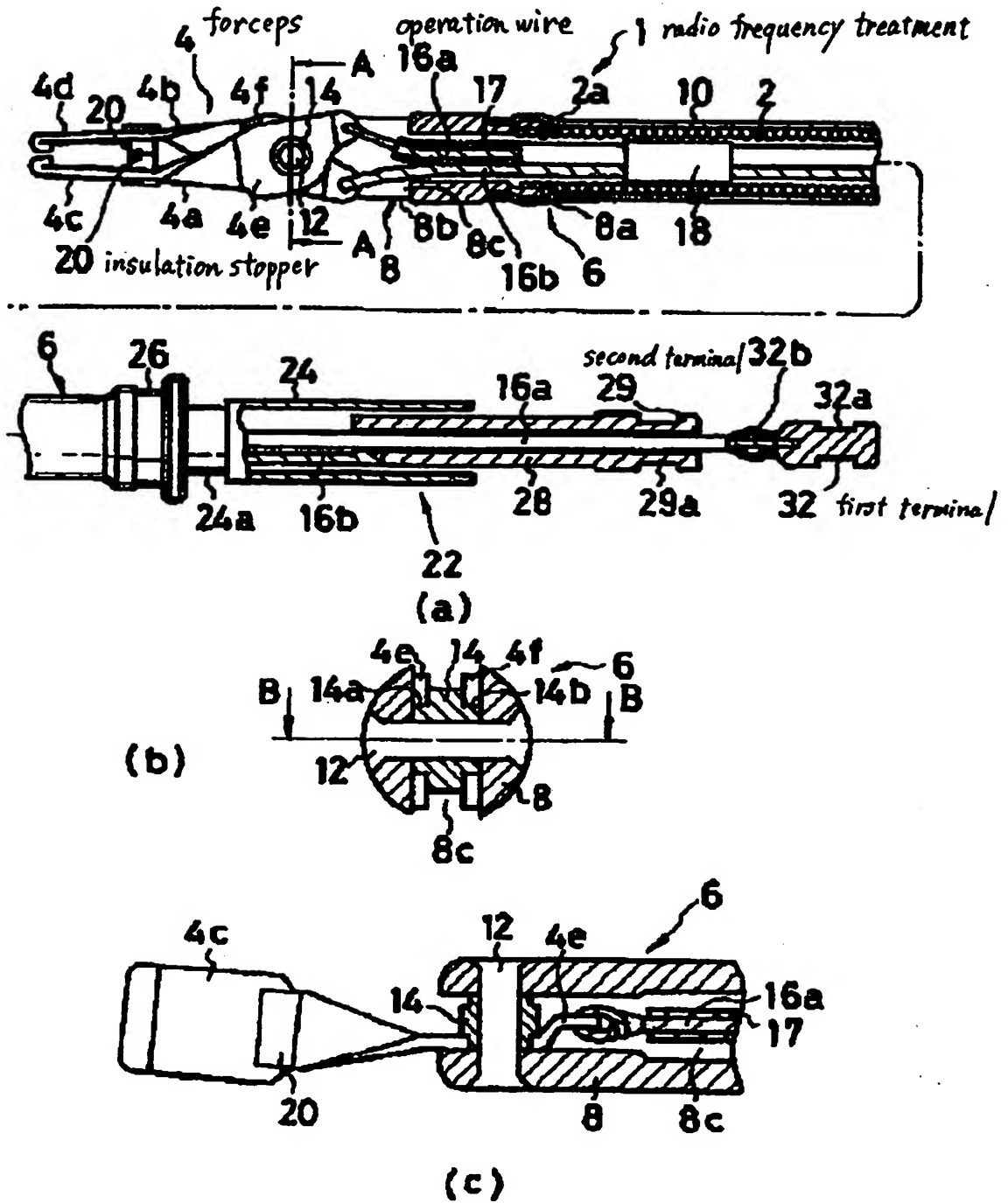


FIG.2

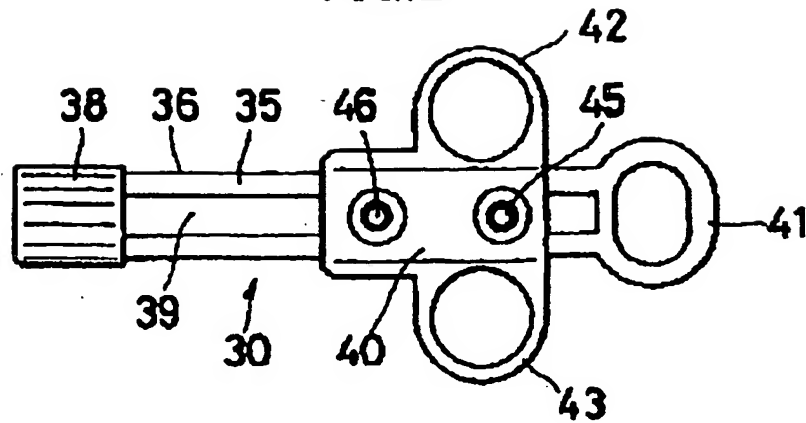


FIG.3

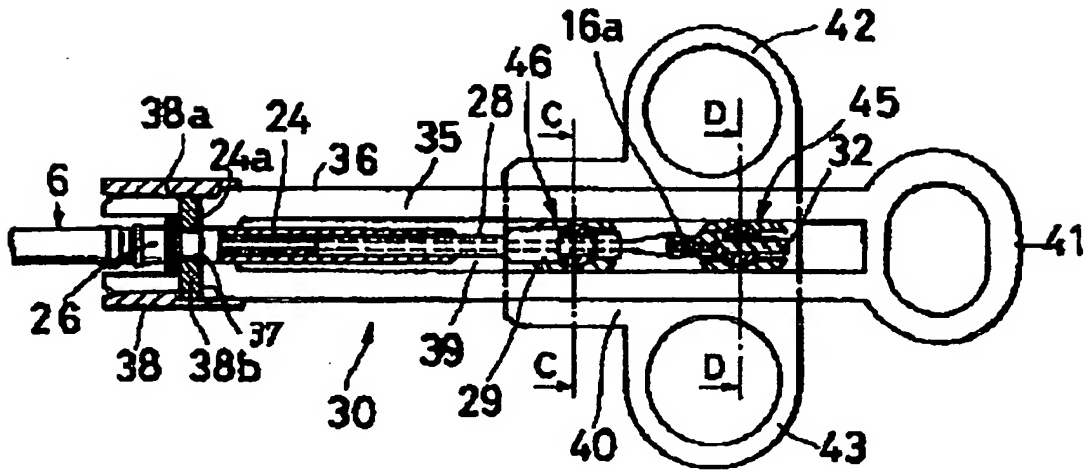


FIG.4

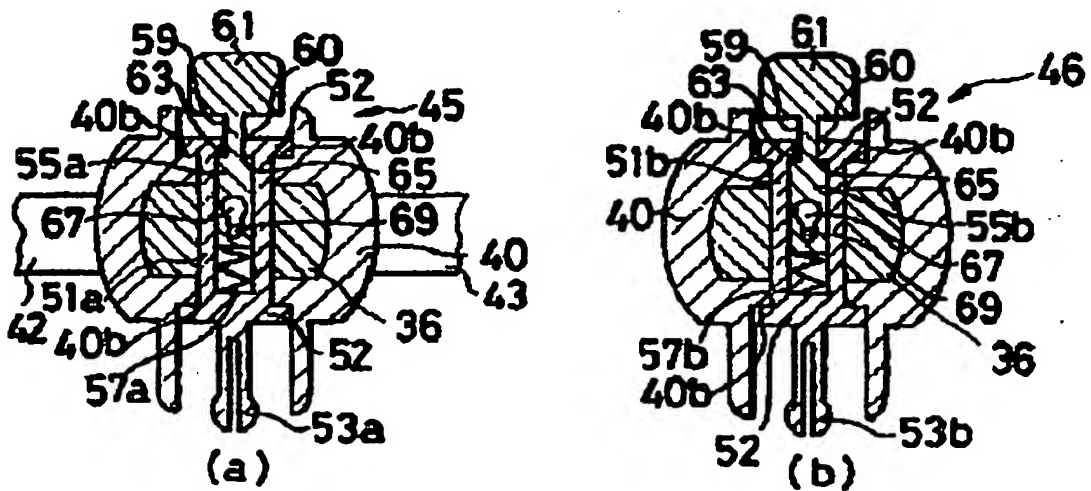


FIG.5

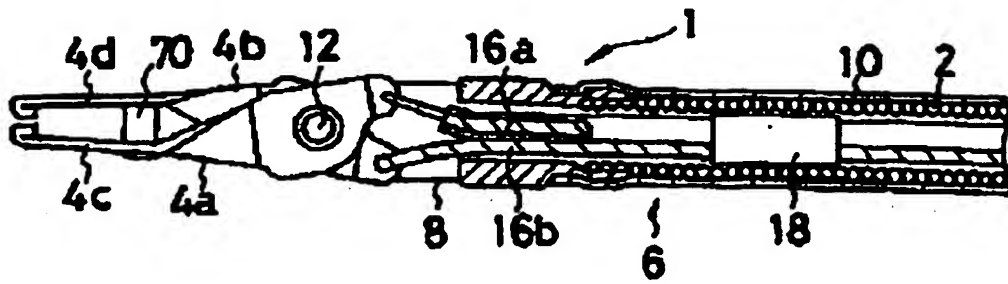


FIG.6

